

of the last four ankylosed cervical vertebræ; this is deepest at the most posterior.

The scapula is somewhat intermediate in type between that of *Balæna* and *Balænoptera*, more particularly *B. Sibbaldi*.

Professor Capellini expresses a strong belief that this whale came from the southern seas, not only from its australoid characters, but also on account of the southern species of parasites on its body, and from its stomach being empty and wrinkled through long fasting (*aggrinzito per lungo digiuno*), showing that it had wandered far from its natural feeding place. As every rule has exceptions, so, remarks the Italian Professor, we may believe that these great vertebrates, with their powerful and rapid means of locomotion, may, though as a rule very local in their habitat, under exceptional circumstances, pass over from their side of the equator and invade the seas of the opposite hemisphere. The Tarentine whale offers a "splendid example" of this fact.

The monograph is accompanied by two plates, representing the bones described in the text, and by a coloured engraving of the whale from a water-colour taken after its capture by Mr. Hueber.

I understand that Professor Van Beneden has recently suggested that the whale above described is *Balæna biscayensis*.

XLII.—*Notes on the Pearly Nautilus* (*Nautilus pompilius*).

By GEORGE BENNETT, M.D., F.L.S.*

IN the Address to the Biological Section of the British Association by J. Gwyn Jeffreys, LL.D., F.R.S., he says, "But *Nautilus* and *Spirula* are believed by some to be deep-water forms. This must be a mistake. Although the animal of that common species *Nautilus pompilius* has rarely been met with, the shells are often found on beaches in the Indian Ocean and South Pacific; and I am not aware of any instance of a deep-water mollusk being cast on shore." In this remark I perfectly agree, and I offer the following notes confirmatory of my opinion. In 'Nature' (11th Feb. 1875) there is a paper entitled "News from the 'Challenger,'" in which it is mentioned, "On the 24th of July we stopped off Matuka Island and landed a party of surveyors and naturalists; and while they were taking observations and exploring

* Read at the Plymouth meeting of the British Association, and communicated by the author.

on shore we trawled in 300 fathoms, and received among other things a fine specimen of the Pearly Nautilus (*Nautilus pompilius*), which we kept living in a tub of water for some time, in order to observe its movements and attitudes." With reference to this interesting capture of a living Nautilus, I very recently received a letter from Prof. Rolleston, dated Oxford, 18th March, 1875, in which he says, "I have just been through a long journal of Moseley's, relating all his experiences and observations on board the 'Challenger,' between Sydney, New Zealand, Fijis, and Cape York. I have compared his account of the capture of his Nautilus with your account of the capture of yours. The 'Challenger's' Nautilus appears to have been obtained from a depth of 320 fathoms on a coral bottom; and it must have been much discomposed by the great differences in pressure to which its upheaval subjected it; but they got it up alive, however discomposed, and they had consequently the opportunity of observing how it behaved. It propelled itself after the manner of the Cephalopods, backwards, if that may be an allowable Hibernicism; but what would not have been expected was the arrangement of its tentacles, each pair of which had a definite and divergent direction—one pair, for example, looking directly downwards, and two other pairs around the eyes being arranged so as to protect that organ as it were. This it was, Moseley says in his Journal, which gave the most characteristic appearance to the creature. But pleased as they all were on board the 'Challenger' with this novel sight, I can understand that you had a feeling of still greater freshness when you had, as the first of scientific observers, the animal in your hands in 1829! How much was based upon the discovery! how much was cleared up by it!"

The extraordinary depth at which the 'Challenger's' specimen of the living Nautilus was obtained far exceeded that which would have been anticipated both from previous accounts and observed facts, the natives capturing them in their traps at from 3 to 5 fathoms, when the experienced and keen eye of the native would be able to descry them in their usual position, clinging to some prominent ledge, with the shell turned downwards on the coral reefs. It is more than probable that the Nautilus, not being considered a deep-sea mollusk, was obtained by the trawl as it passed near the reef, or when the creature was floating at a certain depth, but not on the surface, as when my specimen was captured, and it was thus brought up by the trawl-net. I was informed by an observer on board the 'Challenger' that the captured Nautilus, as it swam about in the tub, propelled itself by ejecting

water from a tube (the funnel?), after the manner of the cuttlefish and other Cephalopods. However, leaving the depth to which it can descend a matter for further inquiry, a question arises, By what power is the animal enabled to regulate its movements of ascent and descent in the water? The use of the chambers in the shell is still a matter of speculation; they are most probably air-chambers destined to assist the specific gravity of the animal; and possibly they may generate nitrogen gas. Professor Owen says, "In acquiring the camerated structure of the shell the Nautilus gains the power of rising from the bottom, and the requisite condition for swimming, by the exhalation of some light gas into the deserted chambers it attaches to its otherwise too heavy body, a contrivance for ascending in its atmosphere, as we ascend into ours by the aid of a balloon. But the Nautilus, superior to the human aeronaut, combines with the power of elevating and suspending itself in the aqueous medium, that of opposing its currents and propelling itself at will in any direction. It possesses the latter essential adjunct to the utility of the balloon as a locomotive organ, by virtue of the muscular funnel, through which it ejects into the surrounding water, doubtless with considerable force, the respiratory currents." He also says, "It appears that the proportion of the air-chambers to the dwelling-chamber of the Nautilus and its contents is such as to render it of nearly the same specific gravity as the surrounding water. The siphon which traverses the air-chambers communicates with the pericardium, and is most probably filled with fluid from the aquiferous cavity." To whatever depth these animals are capable of descending, and whatever may be the amount of pressure they can endure, they no doubt can readily ascend to the surface of the ocean by the means explained by Prof. Owen; and we well know they can float upon the water, as proved by the specimen I captured at Erromanga, and can crawl upon the reefs, as verified by the natives, who thus catch them in their baskets (drawings of which and mode of capture are given in my 'Gatherings of a Naturalist'). They are also now well known to be thrown on shore during heavy gales, and are then sought for and secured as an article of food by the natives, who consider them good eating. They have also been found thrown upon the coral reefs, as in an instance mentioned by my friend Dr. M'Donald, R.N., who, in his paper on the Anatomy of *Nautilus umbilicatus* (rightly *macromphalus*, because *umbilicatus* is not found at the Isle of Pines?), says, "H.M. steamvessel 'Torch,' having visited the Isle of Pines in the month of July 1854, one of the officers had the good fortune to pick up a recent specimen of *Nautilus*

umbilicatus on the outer reef of Observatory Island. The creature had most probably been thrown up by the waves, and remained within a ledge of coral rock when the spring tide receded. The natives frequently find Nautili entrapped in this way; but we could not prevail upon them to bring us the recent animals, although a liberal remuneration was offered. The specimen was alive when brought on board, but it was too much exhausted to exhibit any active movements when placed in a vessel containing sea-water. On touching the tentacula they curled up, or moved about irregularly, and the muscular fibres of the funnel-tube contracted slowly, without, however, producing respiratory currents." Prof. Owen says, alluding to my Nautilus, "The dissection of this unique specimen established the claims of the *Nautilus pompilius* to rank in the highest class of Mollusca, and at the same time brought to light so many important modifications in the Cephalopoda type of structure as to necessitate the establishment of a new order for its reception."

The number of tentacles with which the Pearly Nautilus is provided amounts to not less than ninety, of which thirty-eight may be termed digital, four ophthalmic, and forty-eight labial. In specimens there is a slight difference in the number of the tentacula.

XLIII.—On a new Insect Pest at Madeira.

By T. VERNON WOLLASTON, M.A., F.L.S.

CONSIDERING how terribly the island of Madeira has suffered from the depredations of the *Phylloxera*, whole tracts on which the vine until lately flourished having been completely laid waste, it seems a thankless task to have to place on record yet another scourge which has lately made its appearance in that otherwise highly favoured land, and which, although fortunately of a much less alarming nature, threatens at any rate to make itself felt. I would by no means wish to compare it with *either* of the calamities (as represented by the *Oidium* and the *Phylloxera*) which have overtaken the vine; but the history of the Colorado Beetle will suffice to convince us that other plants, which administer more or less to our comfort, and which constitute an appreciable item of commerce, may so far become the prey of insect parasites that their cultivation is ascertained at last to be a matter of such difficulty that it has practically to be abandoned.